

What is claimed is:

1. A two-stage shock absorber comprising:
 - a pressure tube;
 - a piston rod slidably disposed within said pressure tube, said piston body dividing said pressure tube into two fluid chambers;
 - a piston rod extending through one of said chambers and projecting out of said pressure tube, said piston rod being connected to said piston body;
 - a first and second valve assembly attached to said piston body, said first and second valve assemblies providing a first and a second passageway, respectively, through said piston body;
 - a piston nut attached to said piston rod;
 - a third fluid passageway defined through said piston rod and said piston nut;and
 - a sleeve slidably disposed on said piston nut, said sleeve being operable to progressively close said third passageway when movement of said piston body with respect to said pressure tube exceeds a specified distance.

2. The two-stage shock absorber according to Claim 1 wherein said third passageway comprises a plurality of holes through said piston nut in a downward helical spiral formation.

3. The two stage shock absorber according to Claim 2 wherein said sleeve is operable to progressively close the holes comprising said third passageway individually in series when movement of said piston body with respect to said pressure tube exceeds a specified distance.

4. The two stage shock absorber according to Claim 1 wherein said third passageway is comprised of a single hole and a groove extending from said hole in a downward helical spiral along an outer surface of said piston nut to a terminal end.

5. The two stage shock absorber according to Claim 4 wherein a depth of said groove decreases from said hole to said terminal end.

6. The two stage shock absorber according to Claim 4 wherein said sleeve is operable to progressively cover said hole and said groove when movement of said piston body with respect to said pressure tube exceeds a specified distance.

7. A two-stage shock absorber comprising:
a pressure tube defining a chamber;
a piston rod assembly disposed within said chamber;
a valve assembly fixably attached to said piston rod and slidably engaging said pressure tube within said chamber, said valve assembly dividing said chamber into an upper and a lower working chamber, said valve assembly providing a first and a second fluid flow path between said upper and lower working chambers completely through said

valve assembly, said first and second flow paths of said valve assembly being totally separate from one another; and

a sleeve slidably disposed on said valve assembly, said sleeve being operable to progressively close a third separate and distinct flow path extending between said upper and lower working chambers when movement of said valve assembly exceeds a specified distance, said progressive closing of said third flow path providing a progressively higher resistance to the movement of said valve assembly, said third flow path comprising a plurality of holes through said piston rod assembly arranged in a helical spiral formation.

8. The two stage shock absorber according to Claim 7 wherein said piston rod assembly comprises a piston rod and a piston nut, said plurality of holes extending through said piston nut.

9. The two-stage shock absorber according to Claim 7 wherein said valve assembly comprises a compression valve assembly and a rebound valve assembly.

10. The two stage shock absorber according to Claim 7 wherein said sleeve is frictionally held by said pressure tube.

11. The two stage shock absorber according to Claim 7 wherein said sleeve is operable to progressively close said plurality of holes.

12. A two-stage shock absorber comprising:

- a pressure tube defining a chamber;
- a piston rod assembly disposed within said chamber;
- a valve assembly fixably attached to said piston rod and slidably engaging said pressure tube within said chamber, said valve assembly dividing said chamber into an upper and a lower working chamber, said valve assembly providing a first and a second fluid flow path between said upper and lower working chambers completely through said valve assembly, said first and second flow paths of said valve assembly being totally separate from one another; and

- a sleeve slidably disposed on said valve assembly, said sleeve being operable to progressively close a third separate and distinct flow path extending between said upper and lower working chambers when movement of said valve assembly exceeds a specified distance, said progressive closing of said third flow path providing a progressively higher resistance to the movement of said valve assembly, said third flow path comprising a hole and a groove extending from said hole is a helical spiral along an outer surface of said piston assembly to a terminal end.

13. The two stage shock absorber according to Claim 12 wherein said piston rod assembly comprises a piston rod and a piston nut, said hole and said groove being disposed in said piston nut.

14. The two-stage shock absorber according to Claim 12 wherein said valve assembly comprises a compression valve assembly and a rebound valve assembly.

15. The two stage shock absorber according to Claim 12 wherein said sleeve is frictionally held by said pressure tube.

16. The two stage shock absorber according to Claim 12 wherein a depth of said groove decreases from said hole to said terminal end.

17. The two stage shock absorber according to Claim 16 wherein said sleeve is operable to progressively cover said hole and said groove.

18. The two stage shock absorber according to Claim 12 wherein said sleeve is operable to progressively cover said hole and said groove.